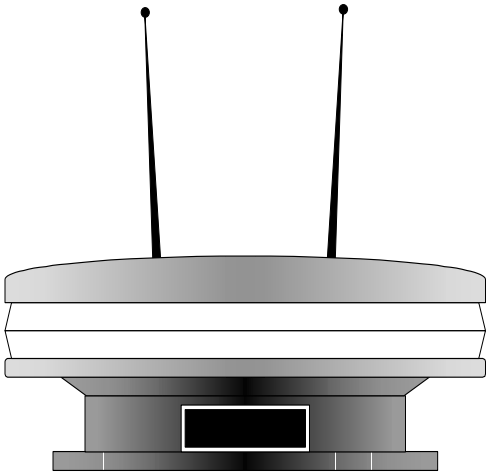
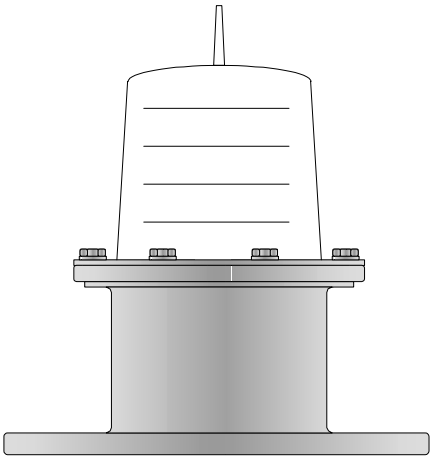
LED LANTERN INSTALLATION INSTRUCTIONS

The Coast Guard has purchased LED lanterns from two successful bidders for field test and evaluation on both fixed and floating aids to navigation. These LED lanterns are intended as replacements for 155mm red and green (only) lanterns currently using 0.55a and 0.77a lamps.



Vega LED Lantern



Zeni LED Lantern

The LED lanterns do not have provisions for terminating wires from the battery and solar panel like our current 155mm lantern using a CG-181 and CG-6P lampchanger. Instead, they are equipped with a 3 meter power cable that is to be terminated in a LED Junction Box on buoys (Figure 4) or at the battery box on fixed aids (Figure 6). The junction box provides a convenient place to terminate the solar panel, lantern and battery without excessive cable runs. ***Installation Note***: While only one lantern style is shown in each of the mounting details, both styles are intended to be installed on both buoys and fixed aids.

Programming

The beacons must be programmed to the proper flash rhythm before deployment. Each beacon is programmed differently and will be discussed separately. The beacons should be programmed and bench tested in the shop prior to transit to the aid.

Zeni

Remove the 6 screws securing the clear cover on the LED lantern with a 5/16" nut driver (preferred) or #1 Phillips screwdriver. Do not lose the O-ring in the base, and washers and bushings attached to the screws.

Lift out the lens assembly and flasher from the lantern base. The power cord will remain attached.

The flash rhythm can be set using the two rotary switches (labeled SW1 and SW2) under the flasher. Set the rhythm using your fingers or a small flat-blade screwdriver according to the chart on the side of the flasher.

Install the flasher and LED stack into the base. The daylight control window must align with the guides in the base, as shown in Figure 1.

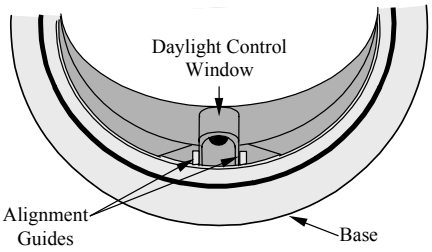


Figure 1.

Be sure the O-Ring is seated in the base. Install the clear cover on the base, aligning the photo sensor sticker with the window of the daylight control. Install and hand-tighten the six screws securing the cover.

Align the marks on the plug and receptacle, as shown in Figure 2 and push the power cable connector together until it "clicks". To uncouple, turn the knurled collar while pulling the connector apart.

Figure 2. Connector Alignment Marks

Vega

Attach the power cable to the Vega LED lantern by aligning the guide slot with the receptacle, push in and tighten the fluted collar to lock in place. Apply 12 VDC to the input leads of the lantern. Black is positive and white is negative.

From the table below, select the appropriate number of "finger taps" corresponding to the desired flash rhythm:

Rhythm	Finger Taps	Rhythm	Finger Taps
FL2.5 (0.3)	1	Q	8
FL4 (0.4)	2	Mo(A)	9
FL6 (0.6)	3	Iso 2	10
FL2.5 (1.0)	4	Iso 6	11
FL (2+1) 6	5	Oc 4	12
FL (2) 5	6	Fix	13
FL (2) 6	7		

Locate the small black disc on the bottom of the lantern. Tap the disc with your finger 5 times. A brief flash indicates that the program mode has been selected. You now have three seconds to start tapping the appropriate rhythm. If you exceed three seconds, or wait more than two seconds between taps, then the lantern must be reprogrammed.

Bench Test

Bench test each beacon with a 12-volt DC power source to ensure proper operation. The recommended interval is 24 hours. Color coding: black is (+) and white is (-). The daylight control in the Vega lantern is above the label on the base and may be covered with black electrical tape for this test. The daylight control in the Zeni lantern is under the clear dome and difficult to cover. Either wrap an opaque material around the clear dome or place the lantern in a darkened room to activate. Check to be sure that the lantern is flashing at the desired rhythm.

Installation – Buoy

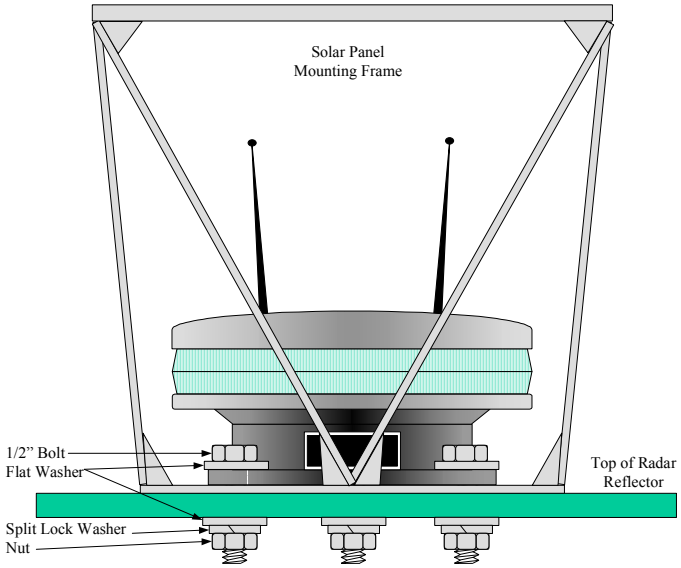


Figure 3.

Sandwich the panel stand between the lantern and buoy and attach with ½" threaded stainless steel bolts, flat washers, split lock washer and nuts, as shown in Figure 3.

If installing a Vega lantern, screw the four bird spikes into the top of the lantern.

Install the appropriate solar panel using the solar panel installation kit and the appropriate number of batteries, and connect as outlined in the Short Range Aids to Navigation Servicing Guide.

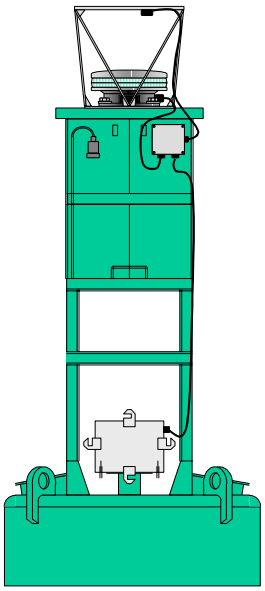


Figure 4.

The LED Lantern Junction Box must be mounted to one of the radar reflectors because it may obstruct the lantern if mounted next to it. Install using the template provided in the LED Lantern Junction Box, mark the four holes to be drilled on the radar reflector with a center punch. Be sure the area behind the radar reflector has room to install hardware (no cross ribs, vertical reflectors, etc.) Drill four 9/32" diameter holes through the reflector. Install the junction box using the provided hardware. Be sure to install the nylon isolation washers between the box and radar reflector. Route the wires through the stuffing tubes, as shown in Figure 5. Tie the cables to adjacent support structures and cut off the excess in the box. Strip the ends of the wire and insert into the Euro type terminal strips and secure with a 3/16" flat blade screwdriver. The terminals are labeled and color coded black for positive and white for negative. The box is gray and may be painted to match the buoy, if desired.

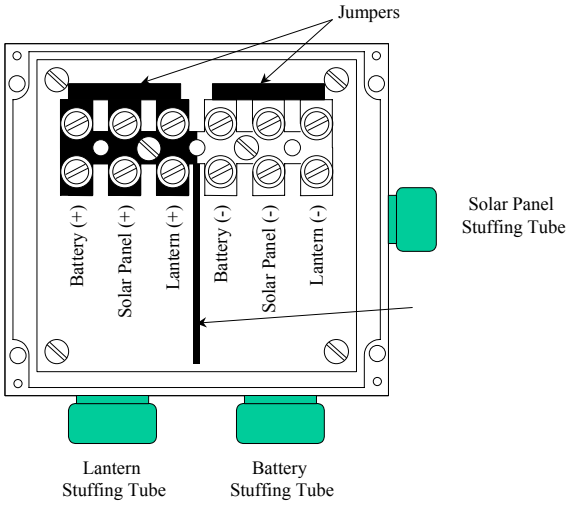


Figure 5.

Cover the photocell and check for proper operation.

Installation - Structures

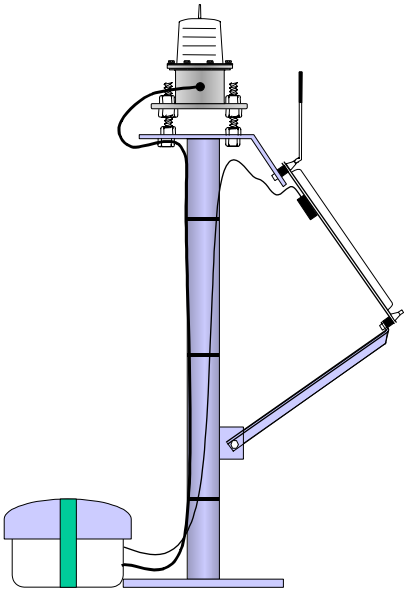


Figure 6.

Mount and level the lantern using three ½" stainless steel studs or bolts. If the lantern does not have a flat surface to place the level, hold a torpedo level beneath the base, sighting the bubble vial through its side. Use the "T" method as shown in Figure 7 and adjust the nuts until level. After tightening, recheck using the level in both directions.

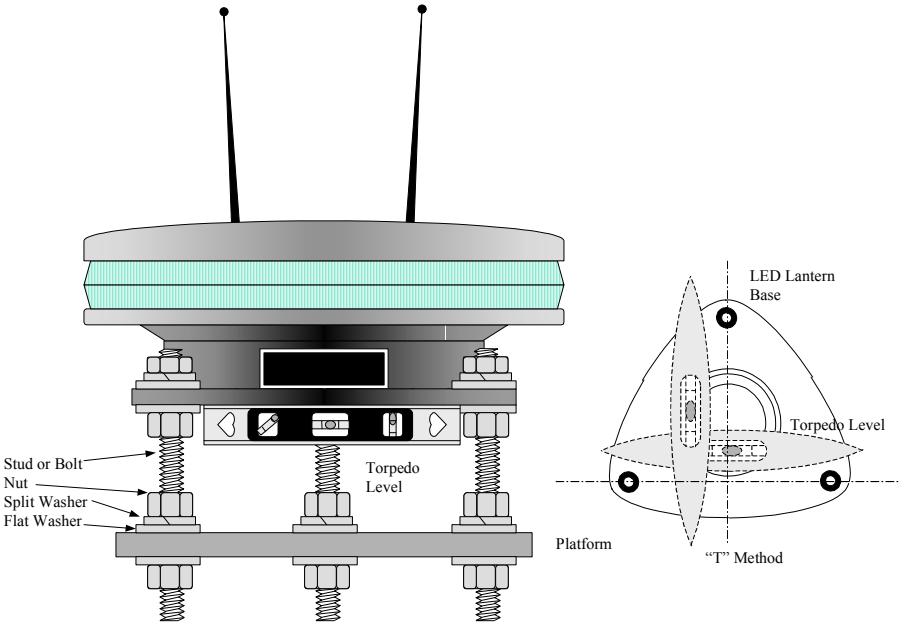


Figure 7.

If installing a Vega lantern, screw the four bird spikes into the top of the lantern.

Install the appropriate solar panel using the solar panel installation kit and the appropriate number of batteries, and connect as outlined in the Short Range Aids to Navigation Servicing Guide. Be sure the tilt angle is appropriate for the area and that the panel is facing south.

The leads from the lantern and solar panel should be terminated in the battery box on structures, as shown in Figure 6. Route the wire and zip tie it along structural members then coil the excess inside the battery box. Crimp the proper ring lug onto each wire, and attach the black leads to the (+) battery terminal and white leads to the (-) battery terminal. Apply No-ox grease or a suitable anticorrosion coating to the battery terminals.

Cover the photocell and check for proper operation.

Power System

The solar sizing tables listed in the Solar Design Manual can be used to size the solar power system. Select the appropriate rhythm and pick the sizing for either a buoy or structure using 0.55a lamps. Alternatively, if you would like to use the Solar Design Spreadsheet, enter the following loads (the current remains the same regardless of the flash rhythm. You must enter the appropriate duty cycle. For number of flashers, enter 0 as the flasher load in these lanterns is negligible):

Zeni Red	0.525 amps	Zeni Green	0.590 amps
Vega Red	0.350 amps	Vega Green	0.350 amps

Servicing

Servicing should be performed in accordance with the standard cycle established for the aid.

Ensure that the lens or lens cover is clean. Wipe with a cloth dampened with mild soap and water, if necessary.

Cover the daylight control to ensure that the lantern flashes on rhythm. Check to be sure all LEDs are lit around the lantern. If a segment is out, it may create an area of reduced intensity or no coverage in that sector. The daylight control for the Vega lantern is above the label on the base, Zeni's in under the lens cover. You make have to cover the Zeni lantern with a rag or jacket to simulate nighttime. Do not open the lantern on station. Parts are not captive and will be easily lost.

Inspect the wiring and power system in accordance with the Short Range Aids to Navigation Servicing Guide. Wiring for the Vega LED lantern must be made up with an Amphenol T3109-081 connector (pin 1 is "+", pin 2 is "-"). Wire for Zeni LED lantern may be replaced with 12/2 SO wired directly to the flasher, however this should not be done on station to prevent loss of parts.

Questions/Comments

Questions and comments may be direct to Mr. Jon Grasson at 202-267-1892, email jgrasson@comdt.uscg.mil